

## **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Canceled).

1 2. (Currently Amended) The method of claim 4 129, wherein one of said chains of  
2 group credentials comprise one or more proofs of group membership.

1 3. (Original) The method of claim 2, wherein said proofs of group membership  
2 comprise one or more group membership certificates.

1 4. (Original) The method of claim 2, wherein said proofs of group membership  
2 comprise one or more group membership lists.

1 5. (Currently Amended) The method of claim 4 129, wherein one of said chains of  
2 group credentials comprise one or more proofs of group non-membership.

1 6. (Original) The method of claim 5, wherein said proofs of group non-membership  
2 comprise one or more group non-membership certificates.

1 7. (Original) The method of claim 5, wherein said proofs of group non-membership  
2 comprise one or more group membership lists.

8.-12. (Canceled).

1 13. (Currently Amended) The method of claim 42 132, wherein one of said chains of  
2 group credentials comprise one or more proofs of group membership.

- 1 14. (Original) The method of claim 13, wherein said proofs of group membership  
2 comprise one or more group membership certificates.
- 1 15. (Original) The method of claim 13, wherein said proofs of group membership  
2 comprise one or more group membership lists.
- 1 16. (Currently Amended) The method of claim ~~12~~ 132, wherein one of said chains of  
2 group credentials comprise one or more proofs of group non-membership.
- 1 17. (Original) The method of claim 16, wherein said proofs of group non-membership  
2 comprise one or more group non-membership certificates.
- 1 18. (Original) The method of claim 16, wherein said proofs of group non-membership  
2 comprise one or more group membership lists.
- 19.-23. (Canceled).
- 1 24. (Currently Amended) The system of claim ~~23~~ 135, wherein one of said chains of  
2 group credentials comprise one or more proofs of group membership.
- 1 25. (Original) The system of claim 24, wherein said proofs of group membership  
2 comprise one or more group membership certificates.
- 1 26. (Original) The system of claim 24, wherein said proofs of group membership  
2 comprise one or more group membership lists.
- 1 27. (Currently Amended) The system of claim ~~23~~ 135, wherein one of said chains of  
2 group credentials comprise one or more proofs of group non-membership.
- 1 28. (Original) The system of claim 27, wherein said proofs of group non-membership  
2 comprise one or more group non-membership certificates.

1 29. (Original) The system of claim 27, wherein said proofs of group non-membership  
2 comprise one or more group membership lists.

30.-34. (Canceled).

1 35. (Currently Amended) The system of claim 34 138, wherein one of said chains of  
2 group credentials comprise one or more proofs of group membership.

1 36. (Original) The system of claim 35, wherein said proofs of group membership  
2 comprise one or more group membership certificates.

1 37. (Original) The system of claim 35, wherein said proofs of group membership  
2 comprise one or more group membership lists.

1 38. (Currently Amended) The system of claim 34 138, wherein one of said chains of  
2 group credentials comprise one or more proofs of group non-membership.

1 39. (Original) The system of claim 38, wherein said proofs of group non-membership  
2 comprise one or more group non-membership certificates.

1 40. (Original) The system of claim 38, wherein said proofs of group non-membership  
2 comprise one or more group membership lists.

41.-58. (Canceled).

1 59. (Currently Amended) A client device on a computer network, said client device  
2 configured for requesting one or more resources from a server on the network, in  
3 which access to said resources is so controlled by said server as to make them  
4 available to members of a nested group, said client device comprising:

5 A. means for presenting to the server a first request to access the resource;

6        B.     means operable in response to a challenge from the server generated by  
7            the first request for performing a search to obtain ~~for obtaining~~ one or  
8            more chains of group credentials that prove client membership in the  
9            nested group, and

10       BC.   means for transmitting to the server a second request for one or more of  
11            the ~~service one or more of the one or more~~ resources, said second  
12            request including the one or more chains of group credentials that prove  
13            client membership in the nested group.

1    60.    (Original) The client device of claim 59, wherein one of said chains of group  
2            credentials comprise one or more proofs of group membership.

1    61.    (Original) The client device of claim 60, wherein said proofs of group membership  
2            comprise one or more group membership certificates.

1    62.    (Original) The client device of claim 60, wherein said proofs of group membership  
2            comprise one or more group membership lists.

1    63.    (Original) The client device of claim 59, wherein one of said chains of group  
2            credentials comprise one or more proofs of group non-membership.

1    64.    (Original) The client device of claim 63, wherein said proofs of group  
2            nonmembership comprise one or more group non-membership certificates.

1    65.    (Original) The client device of claim 63, wherein said proofs of group  
2            nonmembership comprise one or more group membership lists.

1    66.    (Currently Amended) A client device on a computer network, said client device  
2            configured for requesting one or more resources from a server on the network, in  
3            which access to said resources is so controlled by said server as to make them  
4            available to non-members of a nested group, said client device comprising:

- 5 A. means for presenting to the server a first request to access the resource,  
6 B. means operable in response to a challenge from the server generated by  
7 the first request for performing a search to obtain ~~for obtaining~~ one or  
8 more chains of group credentials that prove client non-membership in the  
9 nested group, and  
10 BC. means for transmitting to the server a second request for one or more of  
11 the ~~one or more~~ resources, said second request including the one or more  
12 chains of group credentials that prove client non-membership in the  
13 nested group.

1 67. (Original) The client device of claim 66, wherein one of said chains of group  
2 credentials comprise one or more proofs of group membership.

1 68. (Original) The client device of claim 67, wherein said proofs of group membership  
2 comprise one or more group membership certificates.

1 69. (Original) The client device of claim 67, wherein said proofs of group membership  
2 comprise one or more group membership lists.

1 70. (Original) The client device of claim 66, wherein one of said chains of group  
2 credentials comprise one or more proofs of group non-membership.

1 71. (Original) The client device of claim 70, wherein said proofs of group  
2 nonmembership comprise one or more group non-membership certificates.

1 72. (Original) The client device of claim 70, wherein said proofs of group  
2 nonmembership comprise one or more group membership lists.

73.-100. (Canceled).

1 101. (Currently Amended) A computer program product comprising a computer usable  
2 medium having thereon computer readable program code representing a  
3 sequence of instructions that, when executed by a processor in a network device  
4 requesting one or more resources from a server, in which access to said  
5 resources is so controlled by said server as to make them available to members  
6 of a nested group, configures the network device to operate as a client device  
7 that:

8 A. presents to the server a first request to access the resource,

9 B. in response to a challenge from the server generated by the first request  
10 performs a search to obtain ~~obtains~~ one or more chains of group

11 credentials that prove client membership in the nested group, and

12 ~~BC.~~ transmits to the server a second request for one or more ~~of the one or~~  
13 ~~more~~ resources, said second request including the one or more chains of  
14 group credentials that prove membership in the nested group.

1 102. (Previously Presented) The computer program product of claim 101, wherein one  
2 of said chains of group credentials comprise one or more proofs of group  
3 membership.

1 103. (Previously Presented) The computer program product of claim 102, wherein  
2 said proofs of group membership comprise one or more group membership  
3 certificates.

1 104. (Previously Presented) The computer program product of claim 102, wherein  
2 said proofs of group membership comprise one or more group membership lists.

1 105. (Previously Presented) The computer program product of claim 101, wherein one  
2 of said chains of group credentials comprise one or more proofs of group non-  
3 membership.

- 1 106. (Previously Presented) The computer program product of claim 105, wherein  
2 said proofs of group non-membership comprise one or more group non-  
3 membership certificates.
- 1 107. (Previously Presented) The computer program product of claim 105, wherein  
2 said proofs of group non-membership comprise one or more group membership  
3 lists.
- 1 108. (Currently Amended) A computer program product comprising a computer usable  
2 medium having thereon computer readable program code representing a  
3 sequence of instructions that, when executed by a processor in a network device  
4 requesting one or more resources from a server, in which access to said  
5 resources is so controlled by said server as to make them available to non-  
6 members of a nested group, configures the network device to operate as a client  
7 device that:  
8 A. presents to the server a first request to access the resource,  
9 B. in response to a challenge from the server generated by the first request  
10 performs a search to obtain obtains one or more chains of group  
11 credentials that prove client non-membership in the nested group, and  
12 BC. transmits to the server a second request for one or more of the one or  
13 more resources, said second request including the one or more chains of  
14 group credentials that prove non-membership in the nested group.
- 1 109. (Previously Presented) The computer program product of claim 108, wherein one  
2 of said chains of group credentials comprise one or more proofs of group  
3 membership.
- 1 110. (Previously Presented) The computer program product of claim 109, wherein  
2 said proofs of group membership comprise one or more group membership  
3 certificates.

1 111. (Previously Presented) The computer program product of claim 109, wherein  
2 said proofs of group membership comprise one or more group membership lists.

1 112. (Previously Presented) The computer program product of claim 108, wherein one  
2 of said chains of group credentials comprise one or more proofs of group non-  
3 membership.

1 113. (Previously Presented) The computer program product of claim 112, wherein  
2 said proofs of group non-membership comprise one or more group non-  
3 membership certificates.

1 114. (Previously Presented) The computer program product of claim 112, wherein  
2 said proofs of group non-membership comprise one or more group membership  
3 lists.

115.-128. (Canceled).

1 129. (New) A method of controlling access by a client to a resource that is controlled  
2 by a resource server and is made available to members of a nested group, the  
3 method comprising:  
4 (a) presenting from the client to the resource server a first request to access  
5 the resource;  
6 (b) in response to the first request, sending a challenge from the resource  
7 server to the client to prove membership in the nested group;  
8 (c) in response to the challenge, performing a search at the client to obtain a  
9 chain of group credentials that proves membership in the nested group;  
10 and  
11 (d) presenting from the client to the resource server a second request to  
12 access the resource, the second request including the chain of group  
13 credentials.



1 130. (New) The method of claim 129 wherein membership in each group is controlled  
2 by a group server and wherein step (c) comprises contacting with the client at  
3 least one group server to obtain therefrom group credentials proving membership  
4 in the group controlled by that server.

1 131. (New) The method of claim 130 wherein step (c) further comprises providing from  
2 the client to the at least one group server group credentials proving membership  
3 in a group nested in the group controlled by that server.

1 132. (New) A method of controlling access by a client to a resource that is controlled  
2 by a resource server and is made available to non-members of a nested group,  
3 the method comprising:

- 4 (a) presenting from the client to the resource server a first request to access  
5 the resource;
- 6 (b) in response to the first request, sending a challenge from the resource  
7 server to the client to prove non-membership in the nested group;
- 8 (c) in response to the challenge, performing a search at the client to obtain a  
9 chain of group credentials that proves non-membership in the nested  
10 group; and
- 11 (d) presenting from the client to the resource server a second request to  
12 access the resource, the second request including the chain of group  
13 credentials.

1 133. (New) The method of claim 132 wherein membership in each group is controlled  
2 by a group server and wherein step (c) comprises contacting with the client at  
3 least one group server to obtain therefrom group credentials proving non-  
4 membership in the group controlled by that server.

1 134. (New) The method of claim 133 wherein step (c) further comprises providing from  
2 the client to the at least one group server group credentials proving non-  
3 membership in a group nested in the group controlled by that server.

1 135. (New) A computer system having a resource to which a client desires access and  
2 which is controlled by a resource server so that the resource is made available to  
3 members of a nested group, the system comprising:

4 a mechanism in the client that presents to the resource server a first  
5 request to access the resource;

6 a mechanism in the resource server and operable in response to the first  
7 request, that sends a challenge to the client to prove membership in the nested  
8 group;

9 a mechanism in the client and operable in response to the challenge, that  
10 performs a search to obtain a chain of group credentials that proves membership  
11 in the nested group; and

12 a mechanism in the client that presents to the resource server a second  
13 request to access the resource, the second request including the chain of group  
14 credentials.

1 136. (New) The system of claim 135 wherein membership in each group is controlled  
2 by a group server and wherein the mechanism that obtains a chain of group  
3 credentials comprises a mechanism that contacts at least one group server to  
4 obtain therefrom group credentials proving membership in the group controlled  
5 by that server.

1 137. (New) The system of claim 136 wherein the mechanism that obtains a chain of  
2 group credentials further comprises a mechanism that provides to the at least  
3 one group server group credentials proving membership in a group nested in the  
4 group controlled by that server.

1 138. (New) A computer system having a resource to which a client desires access and  
2 which is controlled by a resource server so that the resource is made available to  
3 non-members of a nested group, the system comprising:

4 a mechanism in the client that presents to the resource server a first  
5 request to access the resource;

6 a mechanism in the resource server and operable in response to the first  
7 request, that sends a challenge to the client to prove non-membership in the  
8 nested group;

9 a mechanism in the client and operable in response to the challenge, that  
10 performs a search to obtain a chain of group credentials that proves non-  
11 membership in the nested group; and

12 a mechanism in the client that presents to the resource server a second  
13 request to access the resource, the second request including the chain of group  
14 credentials.

1 139. (New) The system of claim 138 wherein membership in each group is controlled  
2 by a group server and wherein the mechanism that obtains a chain of group  
3 credentials comprises a mechanism that contacts at least one group server to  
4 obtain therefrom group credentials proving non-membership in the group  
5 controlled by that server.

1 140. (New) The system of claim 139 wherein the mechanism that obtains a chain of  
2 group credentials further comprises a mechanism that provides to the at least  
3 one group server group credentials proving non-membership in a group nested in  
4 the group controlled by that server.